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Research Article

**STUDY TO DETERMINE THE INCIDENCE OF VARIOUS
CAUSES OF PANCYTOPENIA****Dr. Esha Ahmad¹, Dr. Attiya Iqbal², Dr. Zain Ahmar³**
^{1,2,3} Bahawal Victoria Hospital, Bahawalpur**Article Received:** March 2020**Accepted:** April 2020**Published:** May 2020**Abstract:**

Aim: The purpose of this study is to analyze the frequency of underlying pathologies and present the features of pancytopenia.

Place and Duration: In the Medicine and Pathology department of Bahawal Victoria Hospital (BVH) Bahawalpur for one-year duration from February 2019 to February 2020.

Methodology: 60 patients with pancytopenia were included in the study. Patients with chemotherapy and radiation therapy were excluded from the study. Blood counts, bone marrow aspiration and trephine biopsy were performed according to standard methods.

Results: In this study, common causes of pancytopenia were aplastic anemia 20 (33.3%), megaloblastic anemia 16 (26.66%), hypersplastic 16 (25%), acute leukemia 6 (10%), drug-related 3 (5) %, and metastatic tumors 3 (5%).

Conclusion: In this study, aplastic anemia, megaloblastic anemia and hypersplenism were common causes of pancytopenia. Although trephine biopsy is also useful in diagnosing malignant tumors.

Key words: pancytopenia, aplastic anemia, hypersplenism.

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INTRODUCTION:

Pancytopenia is not the presence of a disease, but a triple discovery that can result from a number of disease processes. These disorders may affect the primary or secondary bone marrow and cause the manifestation of pancytopenia¹⁻². Current symptoms can often be attributed to anemia and thrombocytopenia. Leukopenia is a rare cause of the initial presentation, but may become the most serious threat to life during the disorder. Pancytopenia may be caused by a decrease in the production of hematopoietic cells in the bone marrow, e.g. infections, toxins and infiltration of malignant cells or without abnormal cells, may have bone marrow with normal or even hyper skeletal structure, ineffective hematopoiesis and dysplasia, arrest of all cell lines and peripheral maturation blood cell sequestration³⁻⁴. Few suggestions can be found about the most appropriate research approach for pancytopenia. Some experts have not established whether bone marrow testing is necessary for diagnosis, but whether the procedure is necessary in all patients with pancytopenia⁵⁻⁶. Aplastic anemia, megaloblastic anemia, and infections such as malaria and bacterial infections can be common causes of pancytopenia in developing countries⁷. Nutritional megaloblastic anemia is also one of the main causes of pancytopenia. Clinically, patients with pancytopenia should be evaluated for the possibility of bone marrow failure syndrome or acute malignancy, especially when associated with lymphadenopathy or visceral impairment. Bone marrow aspiration and trephine biopsies are one of the most common and relatively safe invasive procedures routinely performed to assess the cause⁸⁻⁹. By using the invasive procedure, it can easily be performed even with severe thrombocytopenia with little or no risk of bleeding. This is usually done to assess unexplained pancytopenia and malignancies

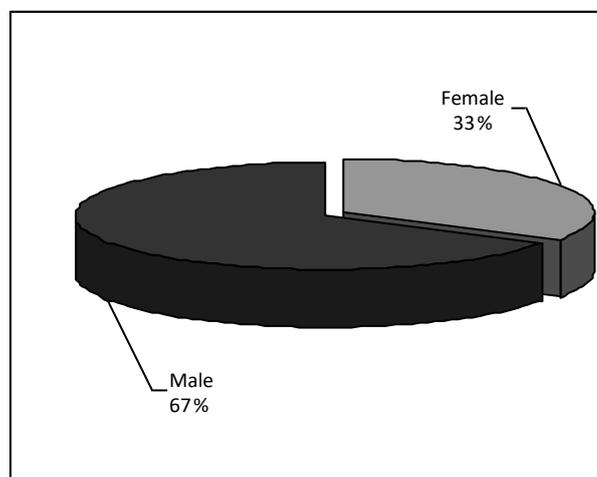
such as leukemia. A bone marrow examination is sometimes performed to diagnose or stage malignancy and storage disorders¹⁰. Trephine biopsy is usually performed when hypoplasia or aplasia is present. There are many different disorders in which bone marrow screening in children provides important diagnostic information.

MATERIALS AND METHODS:

This study was held in the Medicine and Pathology department of Bahawal Victoria Hospital (BVH) Bahawalpur for one year duration from February 2019 to February 2020. Pancytopenia was diagnosed in the presence of anemia (Hb <10 g / dl), leukopenia (WBC <3.5 x 10⁹ / L) and thrombocytopenia (platelets <150 x 10⁹ / L). The study included 60 adult patients. A detailed treatment history was obtained, including treatment history, drug intake, radiation exposure, and physical examination such as pallor, jaundice, liver enlargement, spleen enlargement and lymphadenopathy. Patients with cancer chemotherapy were excluded from the study. Pre-transfusion blood counts were performed on an automated blood analyzer. Differential white blood cell count and red blood cell morphology were done manually by staining blood smears with Giemsa smear. Bone marrow aspiration and trephine biopsy were performed. H&E staining was used for Trephine biopsy. Aspirate and trephine biopsy results were interpreted in the light of history, clinical trials and peripheral blood tests. Standard morphological criteria were used in the diagnosis.

RESULTS:

The study included 60 patients with pancytopenia for one year. Bone marrow aspiration and trephine biopsy were performed according to a standard method.



Of the 60 cases, 40 (66.66%) were men and 20 (33.3%) were women. The ratio of men to women is 2: 1. The age of the patients ranges from 06 to 75 years. The most common clinical features are shown in Table 1.

Table I: Disorders Causing Pancytopenia

Disease	No. of Cases	%age
Aplastic anemia	20	33.33
Megaloblastic Anemia	16	26.66
Hypersplenism	12	20
Acute Leukemia	6	10
Drug induced	3	5
Metastatic Tumor	3	5

The causes of pancytopenia found in this study are shown in Table 2. Bone marrow aplasia represents the largest group i.e. 20 (33.33%), megaloblastic 16 (26.66%), hypersplenism 12 (25%), acute leukemia 3 (10%), drug induced 3 (5%) and metastatic tumors 3 (5%) were found in this study.

Table II Clinical features of patients presented with pancytopenia.

Clinical feature	No. of cases	%age
Pallor	50	83.33
Fever	45	75
Jaundice	16	28
Dyspnea	25	41
Splenomegaly	6	10
Hepatomegaly	6	10
Septicemia	10	16.6

DISCUSSION:

Pancytopenia is usually caused by bone marrow replacement or damage, but sometimes it is the result of accumulation of spleen or peripheral destruction of mature cells. In hospital practice, pancytopenia is often caused by treatment with cytotoxic or immunosuppressive drugs. There are many reasons for pancytopenia¹⁰⁻¹¹. The frequency of causes of pancytopenia has been reported in a limited number of studies. While the most common cause of pancytopenia in this study was aplastic anemia (33.33%), in other studies it ranged from 7.7% to 52.7%. The second most common cause of pancytopenia in this study is megaloblastic anemia (26.66%), from 0.8% to 68% in other studies. In another study in Malaysia, pancytopenia is a common symptom in 64% of patients with megaloblastic anemia¹². A high incidence of nutritional anemia has been observed in India with an increased incidence of megaloblastic anemia. Nutritional anemia may also be responsible for the increased incidence of megaloblastic anemia in the inner heart due to geographical and social similarities¹³. Among nutritional anemia, folate is more common than vitamin B12 in Punjab. The incidence of aplastic anemia in the west is 10-25%, less than observed in this study (38%). It is believed that aplastic anemia is more common in the East than in the West. Increased incidence may be related to environmental factors, such as exposure to toxic chemicals, and not to genetic factors. Since Pakistan is also an agricultural country, pesticides can be an important factor in the occurrence of high aplastic

anemia¹⁴. Savage et al. (1999) observed that the most common cause of pancytopenia was megaloblastic anemia followed by aplastic anemia, acute leukemia, AIDS and hyperplenism. In other studies, pancytopenia is caused by aplastic anemia (29.5%), megaloblastic anemia (22%), leukemia or aleukemic lymphoma (18%) and hypersplenism. In these studies, acute leukemia is the third most common cause of pancytopenia followed by hypersplenism, but in this study, hypersplenism is the third most common cause after acute leukemia.

CONCLUSION:

In this study, aplastic anemia, megaloblastic anemia and hypersplenism were common causes of pancytopenia. Although trephine biopsy is also useful in diagnosing malignant tumors.

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